

CLAIMS

1. A reflective layer comprising a reflective organic radical cation compound, wherein said layer reflects in the infrared region from 1250 nm to 1700 nm.
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2. The reflective layer of claim 1, wherein said layer reflects in the infrared region from 700 nm to 1700 nm.
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3. The reflective layer of claim 1, wherein said organic radical cation compound is a salt of an aminium radical cation.
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5. The reflective layer of claim 1, wherein said organic radical cation compound is a salt of a tetrakis(phenyl)-1,4-benzenediamine radical cation.
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7. The reflective layer of claim 1, wherein the thickness of said reflective layer is 0.1 to 0.3 microns.
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9. The reflective layer of claim 1, wherein the thickness of said reflective layer is 0.4 to 1 micron.
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9. A marking system comprising a reflective layer that is applied over a substrate, wherein said reflective layer comprises a reflective organic free radical compound.

10. The marking system of claim 9, wherein said reflective layer is visibly transparent.
11. The marking system of claim 9, wherein said reflective layer is opaque to optically reading said substrate at one or more infrared wavelengths.
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12. The marking system of claim 11, wherein said reflective layer is reflective at said one or more infrared wavelengths.
- 10 13. The marking system of claim 11, wherein said reflective layer has greater than 10% reflectance at said one or more infrared wavelengths.
14. The marking system of claim 11, wherein said reflective layer has greater than 20% reflectance at said one or more infrared wavelengths.
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15. The marking system of claim 11, wherein said reflective layer has greater than 30% reflectance at said one or more infrared wavelengths.
16. The marking system of claim 11, wherein said one or more infrared wavelengths are in the infrared region of 700 to 2000 nm.
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17. The marking system of claim 11, wherein said one or more infrared wavelengths are in the infrared region of 2000 to 3000 nm.
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18. The marking system of claim 11, wherein said one or more infrared wavelengths are in the infrared region at wavelengths greater than 3000 nm.
19. The marking system of claim 9, wherein said reflective layer is opaque to optically reading said substrate at one or more visible wavelengths.
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20. The marking system of claim 19, wherein said reflective layer is reflective at said one or more visible wavelengths.
21. The marking system of claim 20, wherein said reflective layer has greater than 5 10% reflectance at said one or more visible wavelengths.
22. The marking system of claim 20, wherein said reflective layer has greater than 20% reflectance at said one or more visible wavelengths.
- 10 23. The marking system of claim 20, wherein said reflective layer has greater than 30% reflectance at said one or more visible wavelengths.
24. The marking system of claim 19, wherein said one or more visible wavelengths are in the visible region of 580 to 700 nm.
- 15 25. The marking system of claim 9, wherein said organic free radical compound is a salt of an organic radical cation.
- 20 26. The marking system of claim 9, wherein said organic free radical compound is a salt of an aminium radical cation.
27. The marking system of claim 9, wherein said organic free radical compound is a salt of a tetrakis(phenyl)-1,4-benzenediamine radical cation.
- 25 28. The marking system of claim 9, wherein said organic free radical compound is a salt of a tris(phenyl)-aminium radical cation.
29. A marking system comprising a reflective layer that is applied over a substrate, wherein said reflective layer comprises a reflective organic free radical compound; and wherein an image layer is applied in an imagewise pattern 30

overlying said reflective layer, wherein said image layer comprises optically readable information.

30. The marking system of claim 29, wherein said reflective layer is visibly transparent.

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31. The marking system of claim 29, wherein said reflective layer is opaque to optically reading said substrate at one or more infrared wavelengths.

10 32. The marking system of claim 31, wherein said reflective layer in areas where there is no overlying imagewise pattern of said image layer is reflective at said one or more infrared wavelengths, and wherein said imagewise pattern of said image layer is optically readable at said one or more infrared wavelengths.

15 33. The marking system of claim 29, wherein said reflective layer is opaque to optically reading said substrate at one or more visible wavelengths.

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34. The marking system of claim 33, wherein said reflective layer in areas where there is no overlying imagewise pattern of said image layer is reflective at said one or more visible wavelengths, and wherein said imagewise pattern of said image layer is optically readable at said one or more visible wavelengths.

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35. The marking system of claim 29, wherein said image layer comprises a photochromic material.

36. The marking system of claim 35, wherein said imagewise pattern of said image layer is in a state of high transparency at one or more visible and/or infrared wavelengths in a non-activated state, and reversibly shifts to a state of low transparency at said one or more visible and/or infrared wavelengths in an activated state by the photon-induced reaction of said photochromic material.

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37. The marking system of claim 36, wherein said non-activated state is not optically readable at said one or more visible and/or infrared wavelengths, and wherein said activated state is optically readable at said one or more visible and/or infrared wavelengths.

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38. The marking system of claim 36, wherein said photochromic material comprises an organic free radical compound in one or both of said non-activated and activated states.

10 39. The marking system of claim 36, wherein said photochromic material comprises a salt of an organic radical cation in one or both of said non-activated and activated states.

15 40. The marking system of claim 29, wherein said imagewise pattern comprises a bar code.

20 41. A card stock for a marking system, which card stock comprises a substrate and one or more reflective layers over at least a portion of said substrate, wherein at least one of said one or more reflective layers comprises a reflective organic free radical compound.

42. The card stock of claim 41, wherein said at least a portion of said substrate is visibly transparent.

25 43. The card stock of claim 42, wherein at least one of said one or more reflective layers is opaque to optically reading said substrate at one or more infrared wavelengths.

30 44. The card stock of claim 43, wherein an image layer applied in an imagewise pattern overlying said at least one of said one or more reflective layers, said image layer comprising optically readable information, is optically readable at said one

or more infrared wavelengths when scanned from the side of said card stock on which said image layer was applied and is not optically readable at said one or more infrared wavelengths when scanned from the side of said card stock opposite from which said image layer was applied.

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45. A method of marking an article, which method comprises the steps of:
 - (i) providing a substrate; and
 - (ii) applying a reflective layer over said substrate, wherein said reflective layer comprises a reflective organic free radical compound.

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46. The method of claim 45, wherein said reflective layer is visibly transparent.
47. The method of claim 45, wherein said reflective layer is opaque to optically reading said substrate at one or more infrared wavelengths.

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48. The method of claim 45, wherein said reflective layer is opaque to optically reading said substrate at one or more visible wavelengths.
49. The method of claim 45, wherein said method comprises a step (iii) of applying an image layer in an imagewise pattern over said reflective layer, wherein said image layer comprises optically readable information.
50. The method of claim 49, wherein said reflective layer is visibly transparent.

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51. The method of claim 49, wherein said reflective layer is opaque to optically reading said substrate at one or more infrared wavelengths.
52. The method of claim 49, wherein said reflective layer is opaque to optically reading said substrate at one or more visible wavelengths.

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53. The method of claim 49, wherein said image layer comprises a photochromic material.

54. The method of claim 49, wherein said imagewise pattern comprises a bar code.

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